REMARKS

Applicants submit this Amendment in reply to the Office Action dated October 9, 2003.

In this Amendment, Applicants have amended claims 1 and 4, and added new claims 22-25 to more clearly define the claimed invention. Claims 11 and 14 are independent claims.

Before entry of this Amendment, claims 11-21 were pending in this application, with claims 17-19 having been withdrawn from consideration. After entry of this Amendment, claims 11-25 are pending in this application, with claims 17-19 still having been withdrawn from consideration.

The originally-filed specification, claims, abstract, and drawings fully support the subject matter of amended claims 1 and 4, and new claims 22-25. No new matter was introduced.

In the Office Action, the Examiner rejected claims 11, 13, 15, and 16 under 35 U.S.C. §103(a) as being unpatentable over Obeng et al. (U.S. Patent No. 6,323,131) ("Obeng") in view of Asai et al. (U.S. Patent No. 5,736,770) ("Asai"), and in further view of Cheung et al. (U.S. Patent No. 6,153,521) ("Cheung"); rejected claim 12 under 35 U.S.C. §103(a) as being unpatentable over Obeng, Asai, Cheung, and Avanzino et al. (U.S. Patent No. 6,350,687) ("Avanzino"); and rejected claims 14, 20, and 21 under 35 U.S.C. §103(a) as being unpatentable over Obeng, Asai, Cheung, Avanzino, and Endo et al. (U.S. Patent No. 5,795,828) ("Endo"). Applicants respectfully traverse these rejections.

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Applicants note that "the examiner bears the initial burden, on review of the prior art on any other ground, of presenting a *prima facie* case of unpatentability." In re Oetiker, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992) (emphasis original). To establish a *prima facie* case of obviousness, one criteria that must be met is that the prior art references, when combined, must teach or suggest every aspect of the claim. M.P.E.P. §2143. As will be described below, however, Applicants submit that a *prima facie* case of obviousness has not been established. No proper combination of the cited references, including Obeng, Asai, Cheung, Avanzino, Endo, and the other art of record, teaches or suggests the present invention as claimed in independent claims 11 and 14.

For example, independent claims 11 and 14 each recites a method of manufacturing a semiconductor device including, among other aspects, "forming a second insulating film on the surface of the device, the second insulating film contacting the upper surface of the first insulating film from which the first barrier layer is removed, the second insulating file contacting the protective film." The cited references, whether individually or in combination, do not disclose or suggest at least this aspect of each of claims 11 and 14. For at least this reason, the cited references do not establish a proper case of *prima facie* obviousness.

Obeng discloses depositing a dielectric layer 10 on a silicon substrate 12. Trenches and vias 16 are etched in the dielectric layer 10, and then a thin diffusion barrier/adhesion promoter film 18 is deposited on the dielectric layer 10. A thick copper film 20 is deposited on layer 18, and then the copper layer 20 is treated in accordance with standard CMP processing. A spontaneous self-assembling film 24 is then formed

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on the surface which may, among other things, seal the edges of the silicon and act as a photoresist adhesion promoter. The process is then repeated on top of the spontaneous self-assembling film 24. (Fig. 1; col. 4, lines 9-35). Applicants assume that it is for this reason that page 3 of the Office Action concedes that "Obeng et al. fail to teach forming a second insulating film contacting the first insulating film and the protective film," as the spontaneous self-assembling film 24 is disposed between the dielectric layers 10, as shown in Fig. 1(d), and thus the dielectric layers 10 are not formed such that they contact each other.

However, the Examiner then asserts that Asai discloses such a step. Asai does disclose forming the first conductor layer 9a, forming the oxidation resistant film 11, and etching away a portion of the oxidation resistant film 11 and first conductor layer 9a. However, Asai then discloses forming the second insulating layer 13 ***simultaneously with or subsequent to*** the forming of third insulating layer 6. (Col. 5, lines 62-67) Thus, if the Examiner asserts that layer 13 corresponds to the first insulating film, and layer 6 corresponds to the second insulating film, then it would be impossible to form "the second insulating film contacting the upper surface of the first insulating film," when the alleged first insulating film is, at best, simultaneously being formed with the alleged second insulating film.

Moreover, even assuming, *in arguendo*, that the Examiner's above assertions could be correct, the combination of Obeng and Asai still does not disclose or suggest "forming a second insulating film on the surface of the device, the second insulating film contacting the upper surface of the first insulating film from which the first barrier layer is removed, the second insulating file contacting the protective film." While Obeng may

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disclose removing the barrier layer 18 from dielectric layer 10, Asai discloses forming insulating layer 6, *in arguendo*, in "contact" with insulating layer 13. As the two aspects are disclosed in different references, the cited combination of references cannot disclose forming insulating layer 6 of Asai on the removed barrier layer 18 portion of the dielectric layer 10 of Obeng, as asserted in the Office Action. Such an absence of layers between the first insulating film and the second insulating film is advantageous because it prevents the dielectric constant of the interlayer insulating film as a whole from being raised. (Page 3, lines 13-14 of the specification).

Furthermore, none of the other cited references remedies at least these deficiencies of Obeng and Asai. Accordingly, because the cited references do not establish a proper case of *prima facie* obviousness, Applicants respectfully the allowance of independent claims 11 and 14, and their respective dependent claims.

Applicants further submit that claims 12-13, 15-16, and 20-25 depend from one of independent claims 11 and 14, and are therefore allowable for at least the same reasons that each of those respective independent claims is allowable. In addition, at least some of the dependent claims recite unique combinations that are neither taught nor suggested by the cited references, and therefore at least some also are separately patentable.

In view of the foregoing remarks, this claimed invention, as amended, is neither anticipated nor rendered obvious in view of the prior art references cited against this application. Applicants therefore request the entry of this Amendment, the Examiner's reconsideration and reexamination of the application, and the timely allowance of the pending claims.

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The Office Action contains characterizations of the claims and the related art with which Applicants do not necessarily agree. Unless expressly noted otherwise, Applicants decline to subscribe to any statement or characterization in the Office Action.

In discussing the specification, claims, abstract, and drawings in this Amendment, it is to be understood that Applicants are in no way intending to limit the scope of the claims to any exemplary embodiments described in the specification or abstract and/or shown in the drawings. Rather, Applicants are entitled to have the claims interpreted broadly, to the maximum extent permitted by statute, regulation, and applicable case law.

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

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Dated: January 7, 2004

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